EXHIBIT C

DECISION DOCUMENT FOR THE APPROVAL OF MICHIGAN'S 2016 CLEAN WATER ACT SECTION 303(d) LIST (CATEGORY 5)

Date: FEB 0 2 2017

The United States Environmental Protection Agency (EPA) conducted a complete review of the 2016 Section 303(d) list submitted by the State of Michigan. Based upon this review, EPA determined that Michigan's list of Water Quality Limited Segments (WQLS) still requiring total maximum daily loads (TMDLs) meets the requirements of Section 303(d) of the Clean Water Act (CWA or the Act), and EPA's implementing regulations. Therefore, EPA hereby approves Michigan's 2016 Section 303(d) list. The State's list of WQLS still requiring TMDLs appears in Category 5 of Michigan's 2016 Water Quality and Pollution Control Report (Integrated Report or IR), and EPA's approval extends only to the waterbodies in Category 5. The statutory and regulatory requirements, and EPA's review of the State's compliance with each requirement, are described in detail below.

I. STATUTORY AND REGULATORY BACKGROUND

A. Identification of Waters for Inclusion on Section 303(d) List

Section 303(d) (1) of the CWA directs states to identify those waters within their respective jurisdictions for which effluent limitations required by Section 301(b)(1)(A) and (B) of the Act are not protective enough to implement any applicable water quality standards, and to establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters. The Section 303(d) listing requirement applies to waters impaired by point and/or non-point sources, pursuant to EPA's long-standing interpretation of Section 303(d).

EPA regulations provide that states do not need to list waters where the following controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the Act; (2) more protective effluent limitations required by state or local authority; and (3) other pollution control requirements of state, local, or federal authority.[1]

B. Consideration of Existing and Readily Available Water Quality-Related Data and Information

In developing Section 303(d) lists, states are required to assemble and evaluate all existing and readily available water quality-related data and information, including, at a minimum, consideration of existing and readily available data and information about the following categories of water: (1) waters identified as partially meeting or not meeting designated uses, or as threatened, in the state's most recent Section 305(b) report; (2) waters for which dilution calculations or predictive models indicate non-attainment of applicable standards; (3) waters for which quality problems have been reported by government agencies, members of the public, or academic institutions; and (4) waters identified as impaired or threatened in a non-point source assessment submitted to EPA under Section 319 of the Act.[2] In addition to these minimum

[1] 40 C.F.R. §130.7(b)(1).
[2] 40 C.F.R. §130.7(b)(5).

categories, states are required to consider any other data and information that is existing and readily available. EPA's 1991 Guidance for Water Quality-Based Decisions describes categories of water quality-related data and information that may exist and be readily available.[3] While states are required to evaluate all existing and readily available water quality-related data and information, where appropriate, a state may articulate a rationale for relying or not relying on particular data or information in determining whether to list particular waters.

In addition to requiring states to assemble and evaluate all existing and readily available water quality-related data and information, EPA regulations require states to include, as part of their submissions to EPA, documentation to support decisions to rely or not rely on particular data and information and decisions to list or not list waters. Such documentation needs to include, at a minimum, the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; (3) a rationale for not using existing and readily available data and information; and (4) any other reasonable information required by the Region.[4]

C. Priority Ranking

EPA regulations also codify and interpret Section 303(d)(1)(A) of the Act to require states to prioritize all WQLSs on their Section 303(d) lists for TMDL development, taking into account the severity of the pollution and the uses of the waters, and to identify those WQLS targeted for TMDL development in the next two years.[5] As long as these factors are taken into account, the Act provides that states establish priorities. States may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic and aesthetic importance of particular waters, degree of public interest and support, and state or national policies and priorities.[6]

II ANALYSIS OF THE STATE'S SUBMITTAL

On November 10, 2016, the Michigan Department of Environmental Quality (MDEQ) submitted its 2016 Integrated Report (IR) and cover letter. The State's 2016 303(d) List submittal included the following sections, which are collectively referenced as the Michigan 2016 303(d) List or "2016 Submittal":

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[3] U.S. EPA, Office of Water, *Guidance for Water Quality-Based Decisions: The TMDL Process*, Appendix C (1991) (1991 Guidance). *See also* U.S. EPA, Office of Water, *Guidance for 2008 Assessment Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act* (2008).

[4] 40 C.F.R. § 130.7(b)(6).

[5] 40 C.F.R. § 130.7(b)(4). The prioritization schedule is covered in the State's vision process which is Appendix F of the State's submittal and section 9.3 of the IR. For specific two-year schedule, *see* e-mail between Donna Keclik, EPA, and Kevin Goodwin, MDEQ, January 31, 2017.

[6] *See* 57 *Fed. Reg.* 334040, 33045 (July 24, 1992); *see also* 1991 Guidance.

Table 1. Section 303(d) portion of Michigan 2016 IR Comprising the 2016 303(d) List

Section	Description
Chapter 4 of the IR	Assessment Methodology
Appendix A1	8 and 12 Digit Hydrologic Unit Code (HUC) Basins for the Lower Peninsula
Appendix A2	8 and 12 Digit HUC Basins for the Upper Peninsula
Appendix B	Comprehensive list of assessment unit designated use support
Appendix C	List of assessment units not supporting designated uses and are scheduled for a TMDL (Category 5)
Appendix D1	303(d) list modifications – delistings
Appendix D2	303(d) list modifications – new listings
Appendix E	Public Comments and Responses
Appendix F	State of Michigan's Prioritization Framework for the Long-Term Vision for Assessment, Restoration, and Protection Under the Clean Water Act Section 303(d) Program (July 2015)

Michigan divided its assessed waters into five categories as recommended by EPA's 2006 guidance.[7] EPA is taking action on the list of Category 5 waters for which available data and/or information indicate that at least one designated use is not being supported or is threatened, and for which a TMDL is needed. After full review and consideration of the information presented by the State in its 2016 submittal, EPA is approving the waters identified in Michigan's 2016 IR in Attachment 1 of this Decision Document as impaired waters needing TMDLs. Although the information was considered in EPA's review, EPA is not taking any action to approve or disapprove waters identified in Michigan's 2016 IR in categories 2, 3, and 4 in today's decision, which does not affect EPA's approval of Michigan's 2016 list of impaired waters.

A. Description of the Methodology Used to Identify Waters

EPA's regulations at 40 C.F.R. § 130.7(b)(6) require, among other things, that states provide documentation to support their decisions to list or not list waters including a description of the methodology used to develop the list. Michigan's 2016 Submittal contains the State's current assessment methodology.

Michigan has not adopted its assessment methodology into the State's approved water quality standards. EPA guidance provides that:

> For methodologies that are not part of the state's applicable water quality standards, EPA will consider the methodology as it assesses whether the state conducted an adequate review of all existing and readily available water quality-related information, whether the factors that were used to make listing and removal decisions were reasonable, whether the process for evaluating different kinds of water-quality related data and information is sufficient, and whether the

[7] U.S. EPA, Office of Water, *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to §§ 303(d), 305(b) and 314 of the Clean Water Act,* pp. 29-30 (July 29, 2005) (2006 IR Guidance).

> process for resolving jurisdictional disagreements is sufficient. If EPA finds that the State's methodology is inconsistent with its water quality standards, and its application has resulted in an improper Section 303(d) list, EPA may disapprove the list. Regardless of the suitability of the methodology, EPA must review the list for consistency with the relevant provisions of the CWA and the regulations.[8]

Michigan's assessment methodology describes the information used to determine designated use support for surface waters of the State. For each designated use, the methodology explains the types of data and information the State collects, and how this information is used to determine designated use support. The methodology also describes how data are reported using the five categories identified in EPA's guidance and the process used to develop several of the appendices and summary tables included in Michigan's IR.

In determining the status of Michigan's waters, MDEQ begins with the designated use(s) for each water. MDEQ generally evaluates available data for each parameter independently to determine support for the designated use. Waters will be listed as impaired if any one of the data types indicate that the water is not supporting its designated use. Some particular situations may require consideration of multiple data types in combination. If no data are available for any assessment methods, then a water body is considered not assessed.

As explained in the State's 2016 IR, "A single parameter may be used to make designated use support determinations for more than one designated use. For example, appropriate data for a water body may reveal that water column mercury concentrations exceed the wildlife and human noncancer value (HNV) (non-drinking water)" (Mich. Admin. Code § R 323.1057); in such cases, neither the other indigenous aquatic life and wildlife nor the fish consumption designated uses would be supported and the water body would be listed in Appendix C for both uses. Conversely, the consideration of a parameter with respect to a particular designated use in this assessment methodology "does not preclude the use of that parameter" to make a determination that a different designated use is supported.[9]

MDEQ uses monitoring data related to fish tissue, water chemistry, sediment chemistry, biological integrity and physical habitat, wildlife contaminants, and stream flow. MDEQ also uses data from beach monitoring and inland lake monitoring. In determining the waters to be listed in Category 5 of the 2016 IR, MDEQ reviewed the 2014 Integrated Report (used as a baseline); fish consumption advisories for the State as of February 2015; dilution calculations, trend analyses, predictive models for determining the physical, chemical, or biological integrity of surface waters; reports of fish kills and chemical spills, surface water quality monitoring data submitted by external parties and agencies; and other information.[10]

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[8] 2006 IR Guidance, pp. 29-30.
[9] Michigan, "Water Quality and Pollution Control in Michigan, 2016 Sections 303(d), 305(b), and 314 Integrated Report (hereafter MI 2016 IR), p. 39, http://www.michigan.gov/documents/deq/wrd-swas-ir2016-report_541402_7.pdf (last checked January 24, 2017).
[10] MI 2016 IR, at 36-37.

Table 2 summarizes the process MDEQ identified in Chapter 4 of the Michigan 2016 IR for its determination of impaired waters and associated designated uses, assessment types, and parameters.

EPA is engaged in ongoing discussions with Michigan to refine the current listing methodology. Background on EPA's issues and the State's responses are listed in the index of documents considered.

Table 2: How Michigan applies Data for Developing Category 5 List			
Designated Use (DU) and Citation to Relevant Section of the MI 2016 IR	**Assessment Type**	**Parameter(s) Assessed**	**Assessment Method**
Agriculture Section 4.4	No specific type	No specific indicator	MDEQ does not use a specific assessment method to evaluate support of this designated use. Information regarding the support of this use is evaluated on a case-by-case basis using best professional judgment (BPJ).
Navigation Section 4.4	No specific type	No specific indicator	MDEQ does not use a specific assessment method to evaluate support of this designated use. Information regarding the support of this use is evaluated on a case-by-case basis using BPJ.
Industrial Section 4.4	No specific type	No specific indicator	MDEQ does not use a specific assessment method to evaluate support of this designated use. Information regarding the support of this use is evaluated on a case-by-case basis using BPJ.
Warmwater Fishery and Coldwater Fishery Section 4.5	Physical/Chemical (i.e. water chemistry data and supporting land data such as habitat)	Dissolved Oxygen (DO)	Ambient DO data are compared to the standard, per Mich. Admin. Code §§ R 323.1064 and R 323.1065,[11] to determine designated use support. Waters not meeting the DO standard are generally listed in Category 5. The number of instantaneous DO samples needed to make a support determination is evaluated on a case-by-case basis using BPJ. Continuous data collected over a long period of time (e.g. two weeks) are preferred over periodic single samples.
Warmwater Fishery and Coldwater Fishery Section 4.5	Physical/Chemical	Temperature	Ambient temperature data are compared to the standard (per Mich. Admin. Code §§ R 323.1069, R 323.1070, R 323.1072, R 323.1073, and R 323.1075, depending on the waterbody type) to determine designated use support. Waters not meeting the temperature standard are generally listed in Category 5. The number of

[11] https://www.michigan.gov/documents/deq/wrd-rules-part4_521508_7.pdf.

			temperature samples needed to make a support determination is evaluated on a case-by-case basis using BPJ.
Warmwater Fishery and Coldwater Fishery Section 4.5	Physical/Chemical	Ammonia (un-ionized)	MDEQ compares the calculated un-ionized ammonia values to the standard (per Mich. Admin. Code § R 323.1057) to determine designated use support. Waters not meeting the un-ionized ammonia standard are generally listed in Category 5. The number of total ammonia samples needed to make a support determination is evaluated on a case-by-case basis using BPJ. "Supporting site-specific pH and temperature data are generally required. Continuous pH and temperature data over a longer period (e.g. two weeks) of time are preferred."
Warmwater Fishery and Coldwater Fishery Section 4.5	Physical/Chemical	pH	Ambient pH samples are compared to the standard, Mich. Admin. Code § R 323.1053, to determine designated use support. Waters not meeting the pH standard are generally listed in Category 5. In general, a decision of "not supporting" for pH will be based on a 10 percent exceedance threshold following EPA guidance (EPA, 2002). The methodology provides that "If more than 10 percent of representative samples (with continuous monitoring being the preferred method) exceed the criteria set forth in [Mich. Admin. Code §] R 323.1053, the site is listed as "not supporting." The number of pH measurements needed to make a support determination is evaluated on a case-by-case basis using BPJ.
Warmwater Fishery and Coldwater Fishery Section 4.5	Physical/Chemical	Toxics	Warmwater and coldwater fishery designated use support determinations related to non-Bioaccumulative Chemicals of Concern (BCC) are made by comparing ambient water column chemical concentrations to Aquatic Maximum Values and Final Chronic Values per Mich. Admin. Code § R 323.1057 using Figures 4.1a, which provides a flow chart for making determinations of "other indigenous aquatic life and wildlife and warmwater/coldwater fishery designated uses support using water column toxic substance concentration for non-BCCs," and following the process for assessing water column toxic substance concentrations described in section 4.6.1.1 of the Methodology.

Warmwater Fishery and Coldwater Fishery Section 4.5	Biological	Fish Community	Procedure 51 (P-51) is generally used to determine support for the warmwater and coldwater fishery uses. P-51 includes a habitat assessment, a macroinvertebrate assessment, and a fish assessment. The State uses P-51 to rate wadeable streams and rivers for warmwater fisheries. A rating of "poor" is used when the biological community (in this instance, the fish community) is below the expected level for a stream or river segment, and the water is placed in either Category 5 (not supporting) or Category 3 (insufficient information). Waters are placed in Category 5 for the warmwater fishery if: a "poor" rating is assigned using P-51, fewer than 50 fish are collected, or if the relative abundance of fish with anomalies exceeds 2%." Waters are placed in Category 5 for the coldwater fishery if: "coldwater fish communities with salmanoid relative abundance of less than 1%, or if fewer than 50 fish are collected or if the relative abundance of fish with anomalies exceeds 2% (applies to both warmwater and coldwater fishers) depending on the quality and amount of supporting contextual information available." A waterbody with a "poor" rating would be placed in Category 3 if MDEQ determines that the data used in P-51 are not representative. The Methodology provides: "For example, a waterbody with a temporarily poor fish community due to a short-term chemical spill may be listed in Category 3 if remediation occurred and the community was expected to recover." One bioassessment result is generally sufficient to make a support determination using P-51. Sites are selected using targeted study designs. The Methodology explains that "Fish community data for wadeable streams and rivers collected using methods other than P-51 are evaluated on a case-by-case basis using BPJ." The MI 2016 IR also states that "Additional factors considered in determining support of the fishery designated uses are the presence of indicator species such as cisco in coldwater lakes or walleye in warmwater lakes at densities sufficient to indicate waterbody

			support of a healthy food web that could maintain taxa of such trophic levels."
Other Indigenous Aquatic life and Wildlife Section 4.6	Physical/Chemical	Toxics	As explained in the MI 2016 IR, "To determine other indigenous aquatic life and wildlife designated use support using toxic substances, ambient water column chemical concentrations are compared to Wildlife, Aquatic Maximum, and Final Chronic Values per R 323.1057 using Figures 4.1a and b, as described below. Water chemistry monitoring sites are selected using both targeted and probabilistic study designs. All site-specific water column chemistry data are used to determine other indigenous aquatic life and wildlife designated use support. Additionally, site-specific water column chemistry data for non-BCCs are also used to determine warmwater and coldwater fishery designated use support, as described in Section 4.5.1.5. and illustrated in Figure 4.1a, below."
Other Indigenous Aquatic life and Wildlife Section 4.6	Physical/Chemical	Nutrients	Ambient nutrient data (*i.e.* nitrogen and phosphorus) are used along with biological indicators to determine attainment of the designated use using BPJ "to interpret conditions related to this narrative standard. Nutrient samples collected between July and September, when the environmental effects of nutrients are most likely to occur, are particularly important for making designated use support determinations." If nutrient concerns indicate potential effects on dissolved oxygen, MDEQ may conduct additional studies to link nutrient impacts to effects on warmwater and coldwater fisheries designated uses. MDEQ considers data collected from non-typical sources and methods on a case by case basis using BPJ. For inland lakes, Michigan uses the Carlson Trophic Status Index (TSI) along with macrophyte surveys to determine attainment. "Individual TSI values are calculated using late summer data for each trophic state indicator: summer secchi depth (transparency),

			total phosphorus concentration (epilimnetic) and chlorophyll *a* concentration (photic zone)." A final TSI score is determined by averaging individual (indicator) TSI values, used to determine the trophic status of the lake. "Inland lakes classified as oligotrophic, mesotrophic or eutrophic are generally determined to support the other indigenous aquatic life and wildlife designated use, unless other information exists regarding designated use impacts resulting from excess nutrients (e.g., persistent and significant algal blooms)." Values over 61 are considered "hypereutrophic" and are listed as not supporting or insufficient information, based on contextual information.
Other Indigenous Aquatic life and Wildlife Section 4.6	Physical/Chemical	Ammonia (un-ionized) Concentration	Support determinations of chronic and acute conditions using un-ionized ammonia data to assess the other indigenous aquatic life and wildlife designated use follow the processes in Section 4.5 of the Methodology for water and cold water fisheries described above.
Other Indigenous Aquatic life and Wildlife Section 4.6	Physical/Chemical	pH	Support determinations using pH data to assess the other indigenous aquatic life and wildlife designated use will follow the process found in Section 4.5 for water and cold water fisheries described above.
Other Indigenous Aquatic life and Wildlife Section 4.6	Physical/Chemical	Physical Characteristics	The State does not have specific assessment methods or numeric standards for turbidity, color, oil, films, floating solids, foams, settle-able solids, suspended solids, and deposits. Michigan uses BPJ, along with other assessment types (*i.e.* biological indicators), to determine attainment of the designated use as set out in the narrative standard, Mich. Admin. Code § R 323.1050.
Other Indigenous Aquatic life and Wildlife	Biological	Macroinvertebrate Community	In addition to physical and chemical data, MDEQ generally uses P-51 to determine support for the "Other Indigenous Aquatic life and Wildlife" uses. P-51 includes a habitat assessment, a macroinvertebrate assessment, and a fish assessment. The State

Section 4.6			developed methods in P-51 to determine the rating of wadeable streams and rivers for the macroinvertebrate community. For nonwadeable rivers, Michigan developed methods in *The State's Qualitative Biological and Habitat Survey for Protocols for Nonwadeable Rivers* (the "Nonwadeable Procedure") to evaluate the macroinvertebrate community. Sites are selected using both targeted and probabilistic study designs. One bioassessment result is generally sufficient to make a support determination. A rating of "poor" for both P-51 and the Nonwadeable Procedure is used when the macroinvertebrate community is below the expected level for the waterbody, and the waterbody is placed in either Category 5 (not supporting) or Category 3 (insufficient information). Macroinvertebrate community data for wadeable streams and rivers collected using methods other than P-51 are evaluated "on a case-by-case basis using BPJ." Where P-51 is not appropriate (*e.g.* wetlands, lakes, etc.) biological integrity is evaluated on a case-by-case basis.
Other Indigenous Aquatic life and Wildlife Section 4.6	Biological	Bacteria, Algae, Macrophytes, and Fungi	MDEQ uses site-specific visual observation of bacteria, algae, macrophytes, and fungi to determine attainment of the designated use. In addition, water column nutrient data (*i.e.* nitrogen and phosphorus) may be used to make an attainment decision (*see* nutrient assessment method above). MDEQ uses BPJ to determine whether excessive nuisance conditions exist, using P51 to guide the assessment. P51 offers the following guidance to make these determinations: 1) Cladophora and/or Rhizoclonium is > than 10 inches long covering > 25% of a riffle; 2) Rooted macrophytes are present at densities that impair the designated uses of the waterbody; and 3) Bacterial slimes are present.
Partial and Total Body Contact Recreation	Pathogen Indicators	E. coli	The partial body contact (PBC) use is applicable to all the State waters year-round, while the total body contact (TBC) use is applicable only May 1st – October 31st. Ambient *E. coli* data are compared to their respective numeric standards, Mich. Admin.

Section 4.7			Code §§ R 323.1062 and R323.1100, to determine attainment of each designated use. The State determines nonattainment of the recreational use(s) if: 1) *E. coli* concentrations exceed the geometric mean WQS of 130 *E. coli*/100 milliliters (ml) based on weekly samples collected over the 16-week total body contact recreational period; 2) ten percent of the samples exceed the daily maximum WQS of 300 *E. coli*/100 ml based on weekly samples over the 16-week total body contact recreational period; 3) two or more of the samples collected during May 1st – October 31st exceed the 1,000 *E. coli*/100 ml; or 4) untreated combined sewer overflows or untreated sewage is present in the waterbody. Any deviation from the discussed assessment method is evaluated by MDEQ using BPJ.
Partial and Total Body Contact Recreation Section 4.7	Physical/Chemical	pH	"A determination of not supporting may be made in situations where the pH of surface water is such that direct human contact presents an opportunity for physical danger."
Fish Consumption Section 4.8	Physical/Chemical	Mercury	The State uses site-specific water column mercury data and mercury fish tissue data together to make a designated use support. Ambient water column mercury data are compared to the human non-cancer standard of 1.8 ng/L (based on the geometric mean of four or more samples collected over at least 1 year) and fish tissue mercury is compared to the trigger value of 0.35 mg/kg to make an attainment determination. A water body is considered to not support the fish consumption designated use if either the Michigan Department of Health and Human Services (MDHHS) has issued a site-specific fish consumption advisory for that water body or ambient water column concentrations exceed WQS, as described below. "The presence of MDHHS fish consumption advisories of two meals per

			month, or more restrictive, are used as a basis for a not supporting assessment."
Fish Consumption Section 4.8	Physical/Chemical	PCBs	Michigan compares the ambient water column PCB data to the State's human cancer value (HCV) of 0.026 ng/L (Mich. Admin. Code § R 323.1057). Water bodies with one or more ambient water column PCB samples results greater than the HCV are determined to not support the fish consumption designated use.
Fish Consumption Section 4.8	Physical/Chemical	Bioaccumulative chemicals of concern (BCCs) (not including mercury and PCBs)	"To determine fish consumption designated use support for BCCs other than mercury and PCBs in the water column, ambient water column chemical concentrations are compared to the HNV and HCV for nondrinking water per [Michigan Admin. Code §] R 323.1057 using Figure 4.1b, "Determination of other indigenous aquatic life and wildlife designated use support using water column toxic substance concentration for BCCs,"] (see Section 4.6.1.1)."
Fish Consumption Section 4.8	Other Public Health Indicators	Fish Consumption Advisories for Mercury	MDEQ uses as a basis for a "not supporting assessment," the issuance of an MDHH fish consumption advisory of two meals per month, or a more restrictive rate.
Fish Consumption Section 4.8	Other Public Health Indicators	Fish consumption advisories (FCAs)	The Methodology provides: "A water body is considered to not support the fish consumption designated use if either the MDHHS has issued a site-specific fish consumption advisory for that water body or ambient water column concentrations exceed WQS. . . ."
Public Water Supply Section 4.9	Physical/Chemical	Toxics (not including BCCs)	"For compounds that do not have the potential to bioaccumulate (generally, a bioaccumulation factor of 1) the drinking water HNV and HCV WQS can be used directly to assess the public water supply designated use. The geometric mean of at least four samples collected over a period of one year, is compared to the HNV and HCV drinking water values cited in the State's WQS (R323.1057) to determine attainment. If less than four samples are collected over a period of one year, then the water is evaluated on a case-by case basis using BPJ," and in accordance with the decision flow chart set

			forth at Figure 4.4 of the Methodology, "Determination of the Public Water Supply designated use support using WQS or MCLs."
Public Water Supply Section 4.9	Physical/Chemical	Toxics (BCCs)	The Methodology provides that "for compounds where bioaccumulation has been demonstrated to be an important component in human exposure (generally, a bioaccumulation factor >1), a surrogate screening value will be used to assess the public water supply designated use. In these cases, the MCLs will be used to compare to water column data from an assessment standpoint. The MCLs are used by the MDEQ, Drinking Water Program, as the maximum permissible level of a contaminant in water that is delivered to any user of a public water system." The Methodology further provides: "The MCLs are solely based on the consumption of two liters of water and do not include a fish consumption component in the calculation; because of this, it was decided that MCLs were reasonable to use as a screening value for water column comparison for toxics where bioaccumulation makes direct comparison to WQS inappropriate. Because the MCL is a standard applicable after treatment, an exceedance of an MCL will not be used as the basis for a nonattainment determination. Instead, the water body will be assessed as "Insufficient Information" indicating the need for further investigation and additional coordination with the MDEQ, Drinking Water Program, to complete a full assessment. "Data used for public water supply assessments should be reflective of conditions within the Critical Assessment Zone (CAZ; described in Section 4.10) for a particular intake. Similar to the assessment methods used in Section 4.6.1.1, and USEPA guidance, a minimum of four annual data points are generally used to assess toxic substances following Figure 4.4 (USEPA, 2002)." "The geometric mean of ambient water sample results from a CAZ will be compared to either the WQS or the MCL, as appropriate following the process in Figure 4.4. Geometric mean is chosen to help interpret the surface water data for WQS or MCL comparison

			because these levels are based on long-term exposure of humans to surface water for drinking. In rare instances, limited data (less than 4 data points) demonstrating extreme exceedance of WQS may be used to assess a water body as not supporting the Public Water Supply designated use; if so, the basis for these decisions will be reflected in the ADB."
Public Water Supply Section 4.9	Physical/Chemical	Chlorides	The Methodology provides: "Designated use support determination using chlorides data is made on a case-by-case basis where one or more representative monthly average calculations can be made and compared to R 323.1051(2). With consistent ambient monitoring data (e.g., ambient drinking water intake data) the WQS will be considered not supporting the Public Water Supply designated use if more than 10 percent of samples during the period of review exceed the applicable WQS."
Public Water Supply Section 4.9	Physical/Chemical	Taste and Odor	In making listing determinations, MDEQ considers site-specific complaints of substances causing taste and odor problems in community source waters on a case-by-case basis using BPJ.

B. Consideration of Existing and Readily Available Water Quality-Related Data and Information

In preparing its 2016 IR, MDEQ evaluated water quality data collected by its Water Quality Monitoring Program, fish consumption advisories as of February 2015 by MDHHS, and reports of fish kills and chemical spills. MDEQ performed dilution calculations trend analyses, and/or predictive modeling to determine the physical, chemical and/or biological integrity of surface waterbodies. MDEQ used Michigan's 2014 IR as a baseline for the 2016 IR. MDEQ evaluated surface water quality monitoring data submitted from members of the public and government agencies following public solicitation; and other information. MDEQ considered all data, information, and public comments received during the public comment period and prepared a response to comments document. This document is included in Appendix E of the IR.

EPA has determined that MDEQ took reasonable steps to assemble all existing and readily available water quality-related data and information as required by 40 CFR § 130.7, including data and information from members of the public and government agencies.

Internal Data

For purposes of the development of its 2016 IR, the State established a cut-off date of December 31, 2014 for internal water quality data (*i.e.* data collected by MDEQ and its grantees and contractors). Accordingly, internal data collected between January 1, 2013 and December 31, 2014 were considered during the development of the 2016 IR where the data was quality assured. Additionally, data collected *before* January 1, 2013 that were not used for the 2014 listing cycle were considered for the 2016 IR using the 2016 IR methodology. Water Chemistry Monitoring Project (WCMP) data collected by MDEQ through 2013 were used for this IR. WCMP data collected in 2014 were not quality-checked in time to be used for this IR.

External Data

The December 31, 2014, cut-off date did not apply to water quality data submitted to MDEQ by other parties. MDEQ released a solicitation announcement for outside entities to submit data on MDEQ's web-based calendar. The announcement requested entities that had data collected after January 1, 2013 to submit those data to MDEQ by March 6, 2015 in order for the data to be considered for the 2016 list. This request was published on the MDEQ's calendar on January 12, January 26, February 9 and February 23, 2015. MDEQ also indicated that information was solicited directly from key individuals in the MDNR's Fisheries Division, Michigan Department of Agriculture & Rural Development (MDARD) Right to Farm, United States Forest Service, USFWS, University of Michigan, Alliance for the Great Lakes, and the USEPA. A summary of the data received from outside sources, and a discussion about whether and how they were used, is included in Section 10.2 and presented in Table 10.1 of the State's IR.

Quality Assurance and Quality Control (QA/QC)

The State's 2016 IR provides that:

> The quality assurance/quality control requirements for water, sediment, and fish tissue chemistry and biological data collected by the MDEQ are described in the MDEQ's Quality Management Plan (MDEQ, 2005b). To ensure acceptable data quality, the MDEQ also requires all grantees or vendors receiving state or federal money for the purpose of conducting water quality monitoring to prepare and follow Quality Assurance Project Plans prior to sample collection (MDEQ, 2002a). Other data, such as data submitted by outside agencies or the public, must satisfy the MDEQ's quality assurance/quality control requirements to be used to make designated use support determinations of supporting or not supporting, to change the designated use support, or to reassign water bodies to different categories. Data that do not fully satisfy the MDEQ's quality assurance/quality control requirements or data that are collected and analyzed using techniques that are less rigorous than techniques used by the MDEQ to make designated use support determinations may be used to list a water body for further evaluation (i.e., as insufficient information).[12]

Application of Datasets

Datasets that meet the QA/QC requirements set out by MDEQ are evaluated for each waterbody "to determine if the data are representative of existing conditions and of adequate quality to make designated use support decisions. Data may not be representative of existing conditions if land use, point sources, or hydrologic conditions were substantially changed since the point of the last data collection."[13] Additionally, data may not be adequate if applicable field or laboratory methods have changed.

When making an impairment determination, MDEQ considers the quantity of data (number of data points), as well as the duration (*i.e.* period of time the exceedance occurred), frequency (*i.e.* how often the exceedance occurred), magnitude (*i.e.* how great the exceedance measures above the WQS), and timing (*i.e.* when the exceedance occurred relative to the applicable timeframe of the WQS). Analytical method sensitivity and contextual information (such as seasonality) are also considered. It should also be noted that threshold minimum sample sizes may be required to assess various designated uses, but are not applied as an absolute rule.[14] In some cases, MDEQ has made listing determinations based on its review of smaller available data sets.

MDEQ also notes that, in general, while data collected to determine compliance with permitted activities (such as NPDES discharge data) are not used to determine designated use support. The State may consider ambient data collected by NPDES permittees.[15]

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[12] MI 2016 IR, pp. 37-38.
[13] MI 2016 IR, p. 38.
[14] MI 2016 IR, p. 38.
[15] MI 2016 IR, p. 38.

C. Listing of Waters Impaired by Nonpoint Sources

Section 303(d) lists are required to include all WQLSs still needing TMDLs, regardless of whether the source of the impairment is a point and/or nonpoint source. EPA's long-standing interpretation is that Section 303(d) applies to waters impacted by point and/or nonpoint sources.[16]

After complete and full review of MDEQ's 2016 submittal, U.S. EPA concurs that the State properly listed waters with nonpoint sources causing or expected to cause impairment, consistent with Section 303(d) and U.S. EPA regulations.

D. Removal of Waters and Impairments from the 2014 Category 5

A state may remove a waterbody from the 303(d) list for good cause. 40 C.F.R. § 130.7(b)(6)(iv) provides that good cause includes, but is not limited to, the availability of more recent or accurate data or more sophisticated water quality monitoring, flaws in the original analysis, or changes in conditions. Additionally, EPA guidance provides that once a water body/pollutant combination has an approved TMDL, that water body/pollutant combination can be placed in the Integrated Report category 4A. Category 4A presents waters that are still impaired but have an approved TMDL addressing one or more pollutants causing an impairment.[17]

Appendix D1 to the State's 2016 IR identifies waterbodies and waterbody/pollutant combinations and specific designated uses which MDEQ is removing from the 2014 303(d) list. Michigan delisted 61 causes/pollutants from 40 waterbodies in the 2016 IR that were previously listed in the 2014 IR. Reasons for delisting were either that new data indicated that water quality standards are now attained, or that the original basis for listing was found to be incorrect. Additional detail on the reasons for delisting individual waterbodies is presented in Appendix D1 of the IR.[18] EPA has reviewed MDEQ's delistings, and finds the bases for the delistings to be reasonable.

E. Priority Ranking and Targeting

EPA has also reviewed Michigan's priority ranking and targeting of listed waters for TMDL development, which is required by 40 C.F.R. § 130.7(b)(4).

Prioritization and targeting of listed waters is discussed in Section 9 and Appendix F of the IR. A specific two-year schedule for TMDL development is not included, however, the State does discuss its development priorities for the near term. In a discussion with the State, Michigan clarified that its priorities for the next two years include development of statewide TMDLs for

[16] In *Pronsolino v. Nastri*, the United States Court of Appeals for the Ninth Circuit held that Section 303(d) of the CWA authorizes EPA to identify and establish TMDLs for waters impaired by nonpoint sources, 291 F.3d 1123 (9th Cir. 2002).

[17] See 2006 IR Guidance, pp. 58-59.

[18] MI 2016 IR, Appendix D1 - 2016 303(d) Delistings.

both E. coli and Mercury, a E. coli TMDL for Cass River, and a sediment/biota TMDL for Ox Creek.[19]

While federal regulations require states to prioritize and identify waters targeted for TMDL development,[20] EPA does not approve/disapprove the state's priorities for development.

F. Waters/Pollutant combinations Added to the 2016 Section 303(d) List

Michigan added 312 new waterbody/impairment combinations to the 2016 303(d) list. Waterbody/impairment additions are found in Michigan's 2016 IR, Appendix D2, entitled "New 2016 303(d) Listings."

EPA reviewed the information the State submitted regarding new listings which included the following among other documents: (1) the public comments received and responses to comments, (2) the listing methodology, and (3) public notice information and data solicitation request, and concluded that the State's listing decisions are reasonable.

G. Waters included on the 2016 Section 303(d) list exclude those which are in Indian Country

EPA's approval of Michigan's Section 303(d) list extends to all water bodies on the list with the exception of any waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. EPA is taking no action to approve or disapprove the State's list with respect to those waters at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities under CWA Section 303(d) for those waters.

H. Public Participation

The process for identifying WQLS requires a public participation process. The process is intended to foster public awareness and open decision-making.[21] At a minimum, the public participation process must provide, encourage, and assist the participation of the public or segments of the public which may have a particular interest in a given program or decision.[22] The public notification must be provided far enough in advance of agency action to permit time for public response which in general should not be less than 30 days.[23]

The MI 2016 IR states:

> A draft version of this IR was made available on the MDEQ's Web site for public review and comment from December 2, 2015, through January 8, 2016. This announcement was published on the MDEQ's calendar on November 30, December 14, and 28, 2015. A Webinar was held during the public review and comment period to present information on the IR process, highlight changes between the 2014 and 2016 IR, present the MDEQ's

[19] Email communication between Donna Keclik, EPA, and Kevin Goodwin, MI DEQ, January 31st, 2017.
[20] See 40 CFR § 130.7(b)(4).
[21] See 40 CFR § 25.1(a).
[22] See 40 CFR § 25.3(a) and §25.4(b)(5).
[23] See 40 CFR § 25.4 (c).

> new TMDL prioritization vision, and solicit input and comment on the draft document. Comments on the draft IR were received from the Alliance for the Great Lakes / Michigan League of Conservation Voters, Bay County Director of Environmental Affairs and Community Development, Michigan Farm Bureau, Huron River Watershed Council, Great Lakes Indian Fish and Wildlife Commission, Southeast Michigan Council of Governments, and the USEPA. [24]

1. Public comments on Specific Water bodies not previously discussed

The Alliance for the Great Lakes/Michigan League of Conservation Voters commented on western Lake Erie and Saginaw Bay:

> Michigan's failure to make an impairment determination for these areas is improper since Michigan is required to evaluate and list all waters failing to meet any applicable water quality standard. Michigan should assemble and evaluate all existing and readily available water quality-related data and information against its narrative standards. In particular, Michigan should address data on Lake Erie's phosphorus and algal conditions summarized in the May 2015 report 'Recommended Phosphorus Loading Targets for Lake Erie' developed under the Great Lakes Water Quality Agreement and available online at: http://binational.net/wp-content/uploads/2015/06/nutrients-TT-report-en-sm.pdf. Based on these data, Michigan should list western Lake Erie as impaired by nutrients and algae and develop a TMDL to address the pollution. Michigan should also make a determination on nutrient and algae impairment of Saginaw Bay or explain what additional data is required and set a timetable to obtain the data and make a listing determination.[25]

Bay County commented that the "State of Michigan Phosphorus Reduction Strategy for the Michigan Portion of Lake Erie and Saginaw Bay has not been updated since 1991 and is not an adequate measure to address the nutrient and phosphorus problems in Saginaw Bay and western Lake Erie." [26] Bay County also recommended that Saginaw Bay and western Lake Erie should be added to Michigan's 303(d) list of waters that do not support their designated uses.[27]

In response to these comments, Michigan noted evidence of persistent significant algal blooms in the State's portion of Lake Erie from NOAA satellite images and from the State's own shoreline monitoring.[28] Based on this evidence, Michigan added all waters of Michigan's portion of Lake Erie to its final 2016 303(d) list as Not Supporting the designated use of Other Indigenous Aquatic Life and Wildlife due to nuisance conditions related to nutrient expression, as reflected

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[24] MI 2016 IR, p.105.
[25] Letter from Molly M. Flanagan, Alliance for the Great lakes, and Charlotte Jameson, Michigan League of Conservation Voters, to Kevin Goodwin, MDEQ, January 8, 2016., MI 2016 IR, Appendix E.
[26] State of Michigan Phosphorus Reduction Strategy for the Michigan Portion of Lake Erie and Saginaw Bay http://www.baycounty-mi.gov/Docs/Executive/Phosphorus/PhosphorusReductionStrategy.pdf.
[27] MI 2016 IR, Appendix E-Public Comment, p.15.
[28] See MI 2016 IR, p. 29.

in the State's final submission of Appendix C - Assessment units not supporting designated uses.[29]

MDEQ noted in the IR that although Saginaw Bay is recognized in the IR as eutrophic,[30] this does not provide a definitive indication that it is impaired. MDEQ also discussed Saginaw Bay beaches related to deposits of decaying organic material.

Michigan explained:

> A careful evaluation of available data and scientific information, and a comparison against WQS reveals that there is insufficient information to determine whether designated uses are not supported as a result of the decaying organic matter. Consequently, 142 miles of Saginaw Bay and 37.5 miles of western Lake Erie shoreline are listed as having insufficient information to determine support of the total and partial body contact recreation designated uses. In addition, 1,147 square miles of Saginaw Bay are listed as having insufficient information to determine support of the other indigenous aquatic life and wildlife designated use. The WQS require that nutrients be limited to the extent necessary to prevent stimulation of plant/algae growths that are or may become injurious to the designated uses. However, it is widely believed that nutrients are only one of the many factors contributing to this problem and the relative importance of nutrients compared with other causes is unclear. The presence of the shoreline deposits where phosphorus concentrations are significantly less than those in Saginaw Bay (e.g., Grand Traverse Bay and Lake Michigan's eastern shore) indicate that this is a legitimate question.[31]

As a result, the State did not include Saginaw Bay on category 5 for the Other Indigenous Aquatic Life and Wildlife designated use.[32] Michigan indicated that, in order to better understand beach conditions, the State was considering performing monitoring for Saginaw Bay starting during the summer of 2016.

In discussions with EPA, MDEQ clarified that there were differences between the Michigan portion of Lake Erie and Saginaw Bay with respect to the types of concerns reported and the monitoring data available. Whereas the problems in Lake Erie are related to harmful algal blooms, Saginaw Bay concerns relate to decaying matter washing up onshore. Whereas the State has collected a significant amount of water quality sampling data for Lake Erie, the State began collecting data (including microcystin, nutrients, dissolved oxygen, water temperature, and secchi depth) at four Saginaw Bay beaches in 2016. Although these data were collected outside the timeframe for analysis for the 2016 IR, MDEQ plans to assess these and subsequent data with the aim of making a listing decision regarding Saginaw Bay in its 2018 IR.[33]

[29] MI 2016 IR, Response to Comments, p. 106.
[30] MI 2016 IR, Table 5.1, p. 61.
[31] MI 2016 IR, p. 67.
[32] MI 2016 IR, p. 67.
[33] Record of telephone communications between Peter Swenson (EPA) and Dina Klemans (MDEQ), and between Peter Swenson (EPA) and Mike Alexander (MDEQ), January, 27, 2017.

EPA agrees with MDEQ's assessment showing that the Michigan portion of Lake Erie is impaired by nutrients. EPA finds that the State's conclusion that its portion of Lake Erie does not support the designated use of Indigenous Aquatic Life and Wildlife is appropriate. EPA shares the State's concerns about nutrient enrichment in Saginaw Bay and encourages the State to take additional steps to gather the data needed to complete an assessment for the 2018 IR.

The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) expressed concern about inadequacies in listing waters in the Escanaba River system.[34] Michigan responded by reviewing GLIFWC recommendations and adding 9 waterbodies to the 303(d) list based on impairment of the Fish Consumption designated use with selenium listed as the cause of impairment.[35]

EPA reviewed the public participation information submitted by the State and concludes that the MDEQ adequately addressed the public comments regarding the 2016 303(d) list. EPA also reviewed information made available by MDEQ to the public for review and comment, and MDEQ's announcement of the public comment period. EPA finds that the State's public participation process for the 2016 3030(d) list provided the public with a reasonable opportunity to review and provide comments.

I. Tribal Consultation

Pursuant to Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* and with the *EPA Policy on Consultation and Coordination with Indian Tribes (May 2011),*[36] EPA invited tribal consultation on its action to review Michigan's 2016 303(d) list. On December 9th, 2016, EPA sent a letter of invitation for consultation and coordination on EPA's review and decision on the Michigan 2016 303(d) list of impaired waters. EPA explained that its policy is to consult on a government-to-government basis with Federally recognized tribal governments when EPA actions and decisions may affect tribal interests.

On January 9, 2017, EPA held a conference call to consult with interested Region 5 tribes. The Little River Band of Ottawa Indians and the Little Traverse Bay Bands of Odawa Indians participated on the call. EPA explained the CWA process for setting water quality standards, assessing waters and for listing waterbodies pursuant to CWA 303(d) if they do not meet those standards. EPA also reviewed how tribes can inform and coordinate with the State of Michigan as it goes through the process of assessing waterbodies and establishing its CWA 303(d) list. Discussion included an overview of the State's process and requirements for interested parties to submit monitoring suggestions and data.

The tribes asked questions regarding the timeframe for establishing a TMDL once an impaired waterbody is added to the 303(d) list. In response, EPA provided an overview of recent changes in how states prioritize waterbodies for TMDL development using the TMDL Vision process, and how states determine which waterbodies are added to the 303(d) list. EPA reviewed the State's process for deciding which waterbodies will be monitored for any given two-year

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[34] Letter from Esteban Chiriboga, GLIFWC, to Kevin Goodwin, January 8, 2016.- MI 2016 IR, Appendix E.
[35] MI 2016 IR, p. 111.
[36] EPA Policy on Consultation and Coordination with Indian Tribes, May 4, 2011. http://www.epa.gov/tribal/consultation/consult-policy.htm.

integrated reporting cycle, and how the tribes can submit requests to the State if they believe one or more waterbodies should be prioritized for monitoring and assessment. The consultation period for this EPA decision closed on January 10, 2017. No further questions or concerns were submitted by the tribes.

Attachments

1. Attachment 1 – List of Category 5 Waters Approved
2. Attachment 2 – Administrative Record